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(54) Mobile station positioning system

(57) A mobile station (21) receives signals from at least two base stations (22,23,24) and determines time differences of the clocks of the received signals. The mobile station (21) sends information about the time differences to a positioning service center (26) of the mobile communication system which calculates the position of the mobile station (21) on the basis of the time difference information and base station coordinates and clock information. With the method it is possible to measure signals the strengths of which remain below the minimum decoding level. According to the invention, it is also possible to measure bursts containing short training sequences to improve timing measurement accuracy and measuring speed. The time difference measurement results obtained are transmitted from the mobile station to a base station advantageously by encoding the results in a signalling channel (SACCH) burst. The method enables quick position measuring at short intervals without substantially increasing the load on the mobile station or on the air interface.

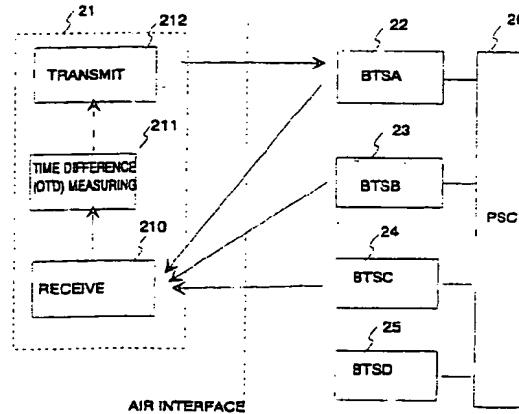


FIG. 3



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EUROPEAN SEARCH REPORT

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	WO 95 00821 A (OMNIPLEX INC) 5 January 1995 * page 9, line 4 - page 10, line 19 *	1-3, 6, 7, 11	H04Q7/38 G01S5/00
Y	* page 14, line 36 - page 19, line 10 *	10	
Y	WO 93 07690 A (MOTOROLA INC) 15 April 1993 * page 3, line 18 - page 5, line 10 * * page 6, line 1 - line 15 * * page 8, line 17 - page 9, line 31 * * page 11, line 8 - page 12, line 29 * * page 13, line 33 - page 14, line 9 *	10	
X	US 5 423 067 A (MANABE SHINICHI) 6 June 1995 * column 4, line 3 - column 5, line 52 *	1, 5-8, 11	
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X	MOULY M ET AL: "THE PSEUDO-SYNCHRONISATION, A COSTLESS FEATURE TO OBTAIN THE GAINS OF A SYNCHRONISED CELLULAR NETWORK" MRC MOBILE RADIO CONFERENCE, 13 November 1991, pages 51-55, XP000618384 * page 54, left-hand column, line 1 - right-hand column, line 22 *	1, 6, 7, 11	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H04Q G01S
The present search report has been drawn up for all claims			
Place of search THE HAGUE	Date of completion of the search 5 March 1999	Examiner Baas, G	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons S : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 96 66 0060

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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